Toward the Active Electronic Medical Record System in the Integrated HIS

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Chiba University Hospital, which has 835 beds and 1600 out patients a day, has been using a client server Hospital Information System (HIS) since 1991. Development of the HIS started in 1978 with hospital administrative data management. Patient database has been constructed since 1981 for supporting clinical activities.

The system has moved onto a new configuration at the beginning of 1996. The new system consists of Fujitsu mainframe computer, SUN workstations and 600 PCs. The replacement of DOS PCs with windows PCs is essential. The PCs and workstations(WSs) are networked for order-entry, DBMS and a decision support system, while the mainframe is used for administrative data management. We are obliged to use the mainframe in correspondence to the Japanese complicated accounting system.

We use the ATM (Asynchronous transfer Mode) and FDDI loop for improvement of data transfer, because we are going to construct a medical image transfer system which handle huge amount of image data such as CR, CT, MRI so on. The PCs for order entry are linked to WSs through ATM, and the WSs and the mainframe are connected by FDDI. Windows NT client systems are installed in all PCs and they are organized as real client server LANs with UNIX WSs.

Most of the programs are written in U-MUMPS, so called 'M' technology of International Standard Organization (ISO) and Japanese Industrial Standard (JIS), and operate under a UNIX system provided by Sumitomo Electric Systems. The use of PCs as order entry and data retrieval terminals gives users opportunities to run PC-based word processors, tabulations or other useful programs. Special effort has been made to design a user-friendly interface with multi-windows, graphic screens and mouse applications using MS Visual Basic (VB).

Several prototype systems of the electronic medical record (EMR) have been developed in Japan, but the EMR systems work actually in defined small hospitals. Toward an active EMR system, we have the advantage of constructing several kinds of patient database including over 20 years laboratory database. Our final target in the integrated HIS is to construct an active EMR system connected with patient database effectively. We hope to be evaluated it as a standard system. We have planned to develop or been applying following items.

- friendly user interface
- the consistency and integrity of patient data description
- standardized medical terminology, such as diagnosis using SNOMED and ICD10
- flexible display design according to the physician's will
- standardized data communication protocol such as HL7.

Governmental restriction to a electronic data repository will be removed, if the upper items are realized and problem of data security is sufficiently discussed and evaluated.

Our approach to the active EMR system introduces a "template" system which is a selection of items and the mapping of items to each patient case on the screen. We have also prepared a Problem Dictionary and a Data Dictionary for the design of data representation in the database. We will establish a comfortable man-machine interface, a firm security system, huge data storage, a quick data communication, etc. and we expect to be able to obtain the effective methods in medical practice and clinical research.